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MARCH 1971

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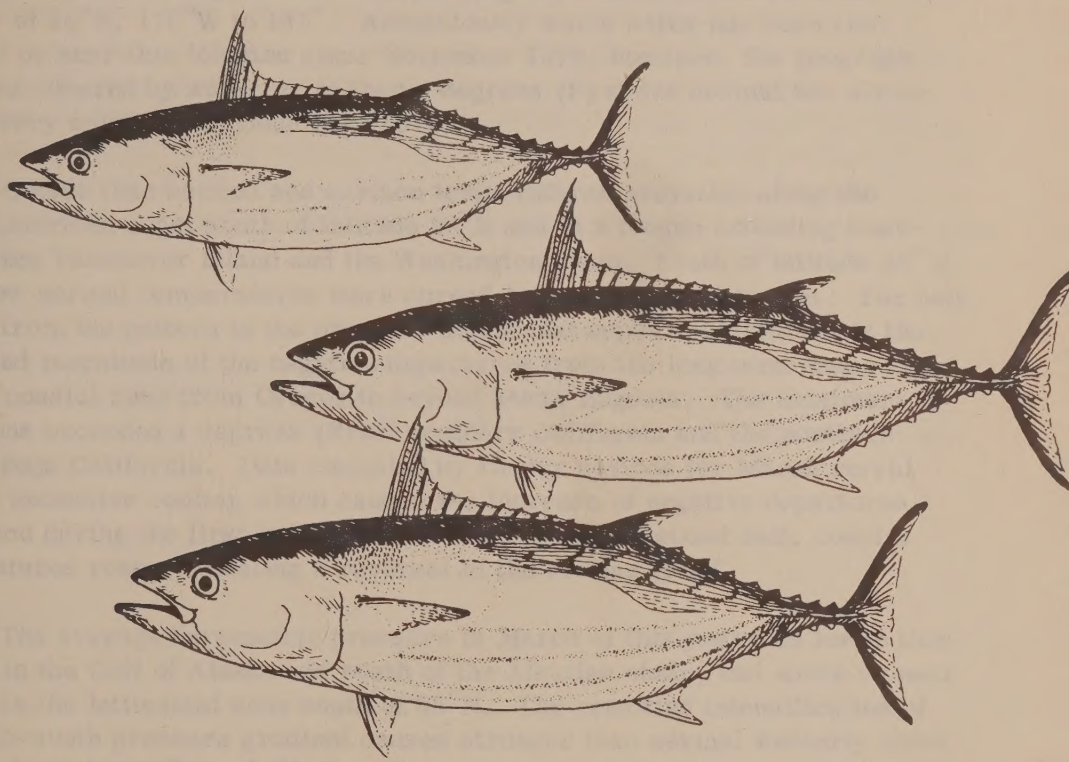
UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Contents

NARRATIVE DESCRIPTION OF OCEAN TEMPERATURE CONDITIONS

Northeastern Pacific

Sea surface temperature continued to be above normal in most of the northeastern Pacific Ocean west of longitude 140°W. (see Fig. 3). The largest positive departures from the long term mean occurred in the vicinity of 45°N, 175°W to 180°. Anomalously warm water has been centered at or near this location since November 1970, however, the geographical area covered by water more than 4 degrees (F) above normal has diminished every month since December 1970.

Cooler than normal sea surface temperatures prevailed along the North American coast south of latitude 50°N and in a tongue extending westward from Vancouver Island and the Washington coast. South of latitude 35°N, the below normal temperatures were spread out over a broader area. The only change from the pattern of the previous month that appears significant is the increased magnitude of the negative departures from the long term mean in a narrow coastal zone from Oregon to beyond Punta Eugenia. The maximum deviations exceeded 4 degrees (F) off southern California and the northern part of Baja California. Data compiled by 15-day periods for March reveal that the excessive cooling which caused the increase of negative departures took place during the first half of the month, but in the second half, coastal temperatures rose, indicating a reversal of the cooling trend.

The average barometric pressure in March of this year was lower than normal in the Gulf of Alaska and south of the Aleutian chain, and above or near normal in the latitudinal zone south of 35°N. The resulting intensification of the north-south pressure gradient caused stronger than normal westerly winds between latitudes 35°N to 50°N (see Figs. 8 and 9). This flow was directed parallel to the sea surface isotherms for the most part and consequently no large change of sea temperature due to abnormal displacement of warm or cold water would be expected. The mean northwest winds observed along the California and Baja California coasts in March also were somewhat stronger than normal and, in contrast to the negligible effect of the mid-latitude westerlies, may have contributed to the excess cooling of the coastal waters by inducing increased upwelling.

Eastern Tropical Pacific

Surface water temperatures remained below 74 degrees (F) in a narrow equatorial zone between longitudes 110°W and 135°W (see Fig. 5). This

constitutes a departure from normal of about 6 degrees (F) and a continuation of the abnormally cold condition which has persisted along this portion of the equator for several months (see Fig. 6). Farther west, sea water temperatures along the equator have increased sufficiently since February to reduce the magnitude of negative departures in that area.

Shifts in the pattern of anomalous temperatures southwest, south and southeast of Hawaii resulted in larger areas of colder than normal water and a consequent diminishing of relatively warm areas. The below normal coastal temperatures between Acapulco and Mazatlan remained about the same as in the previous month. The region of the Costa Rica dome (near 10°N, 90°W) remained colder than normal but the distribution of temperatures and of deviations from the long term mean are not as simply defined as in February. On the other hand, the above normal temperatures in the Gulf of Panama and the area to the southwest (toward the Galapagos) represent a shift from below normal temperatures a month earlier.

Staff, Fishery-Oceanography Program
R. Michael Laurs, Leader

FARALLON ISLANDS NATIONAL WILDLIFE REFUGE

The Bureau of Sport Fisheries and Wildlife, U. S. Department of the Interior, reminds fishermen and others operating in the vicinity of the Farallon Islands off San Francisco, that these islands are a National Wildlife Refuge and that all species of wildlife on these islands are protected by law.

The Bureau advises that the islands are patrolled by the Coast Guard and California Department of Fish and Game authorities, and by Bureau officers. The islands provide nesting sites for a variety of birds, as well as habitat for other kinds of wildlife, including seals and sea lions. Shooting and other acts of vandalism endanger the wildlife of the islands, and disturbance of any kind during the spring nesting season can seriously affect the production of wildlife.

Trollers working in this area are asked to avoid the islands whenever possible. Questions about the islands or activities on them may be directed to the Bureau of Sport Fisheries and Wildlife, 650 Capitol Mall, Room 4066, 4008 Federal Bldg., Sacramento, California 95814, or telephone Area Code 916, 449-2202.

SEA SURFACE TEMPERATURE CHARTS, PACIFIC OCEAN

MARCH 1971

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National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Biological Laboratories La Jolla, California; Honolulu, Hawaii; Seattle, Washington
National Weather Service, San Diego, California
National Ocean Survey, Pacific Marine Center, Seattle, Washington
Pacific Environment Institute, Fisheries Research Board of Canada, West Vancouver, British Columbia, by H. J. Hollister from observations by G. C. Wilks at Langara Island Light; K. D. Godin at Cape St. James Light; Lily Collins at Kains Island Lightstation; O. A. Edwards at Amphitrite Point Light
Pacific Missile Range, Range Operations Department, Geophysics Division, Point Mugu, California
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Scripps Institution of Oceanography Research Vessels ALEXANDER AGASSIZ, MELVILLE, THOMAS WASHINGTON, ALPHA HELIX, ELLEN B. SCRIPPS
States Lines, S.S. MICHIGAN
U.S. Naval Weather Service, Fleet Numerical Weather Central, Monterey, California

Charts

Figure 1. -- Mean sea surface temperature, eastern north Pacific Ocean. Squares show temperatures at weather ship stations. Numerals on shore are temperatures at coastal and lightship stations.

Figure 2. -- Mean sea surface temperature chart, western north Pacific Ocean.

Figure 3. -- Deviation of sea surface temperatures, eastern north Pacific Ocean from long term charts of H.O. 225. Hatched areas are colder in 1971.

Figure 4. -- Deviation of sea surface temperatures, eastern north Pacific Ocean from those of March 1970. Hatched areas are colder in 1971.

Figure 5. -- Mean sea surface temperature, eastern tropical Pacific Ocean. Numerals on shore are temperatures at coastal stations.

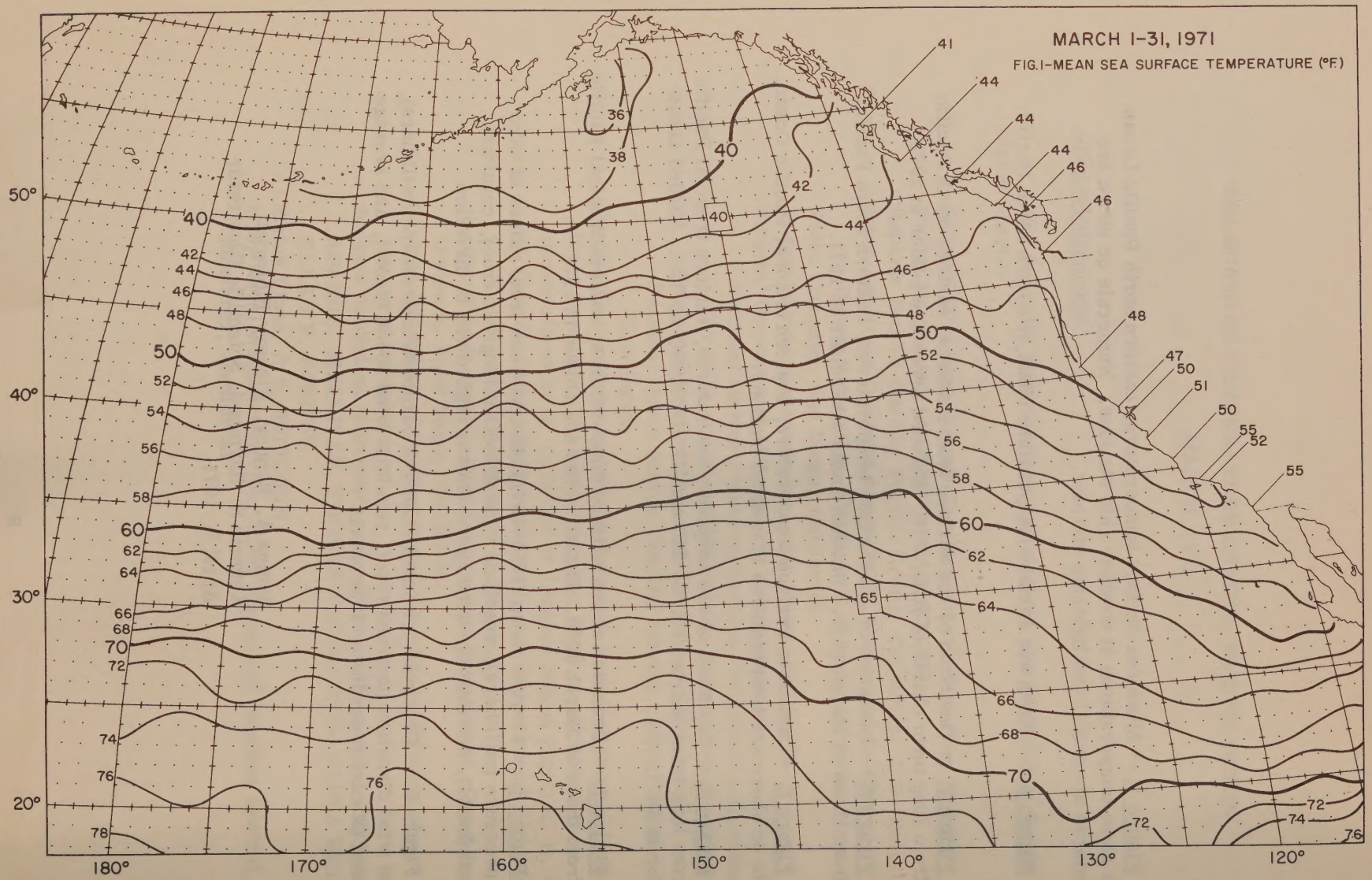
Figure 6. -- Deviation of sea surface temperatures, eastern tropical Pacific Ocean from long term charts of H.O. 225 and NAVOCEANO sp-123. Shaded areas are colder in 1971.

Figure 7. -- Deviation of sea surface temperatures, eastern tropical Pacific Ocean from those of March 1970. Shaded areas are colder in 1971.

Figure 8. -- 11-year mean (1961-1971) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots), and average wind speed (knots) regardless of direction.

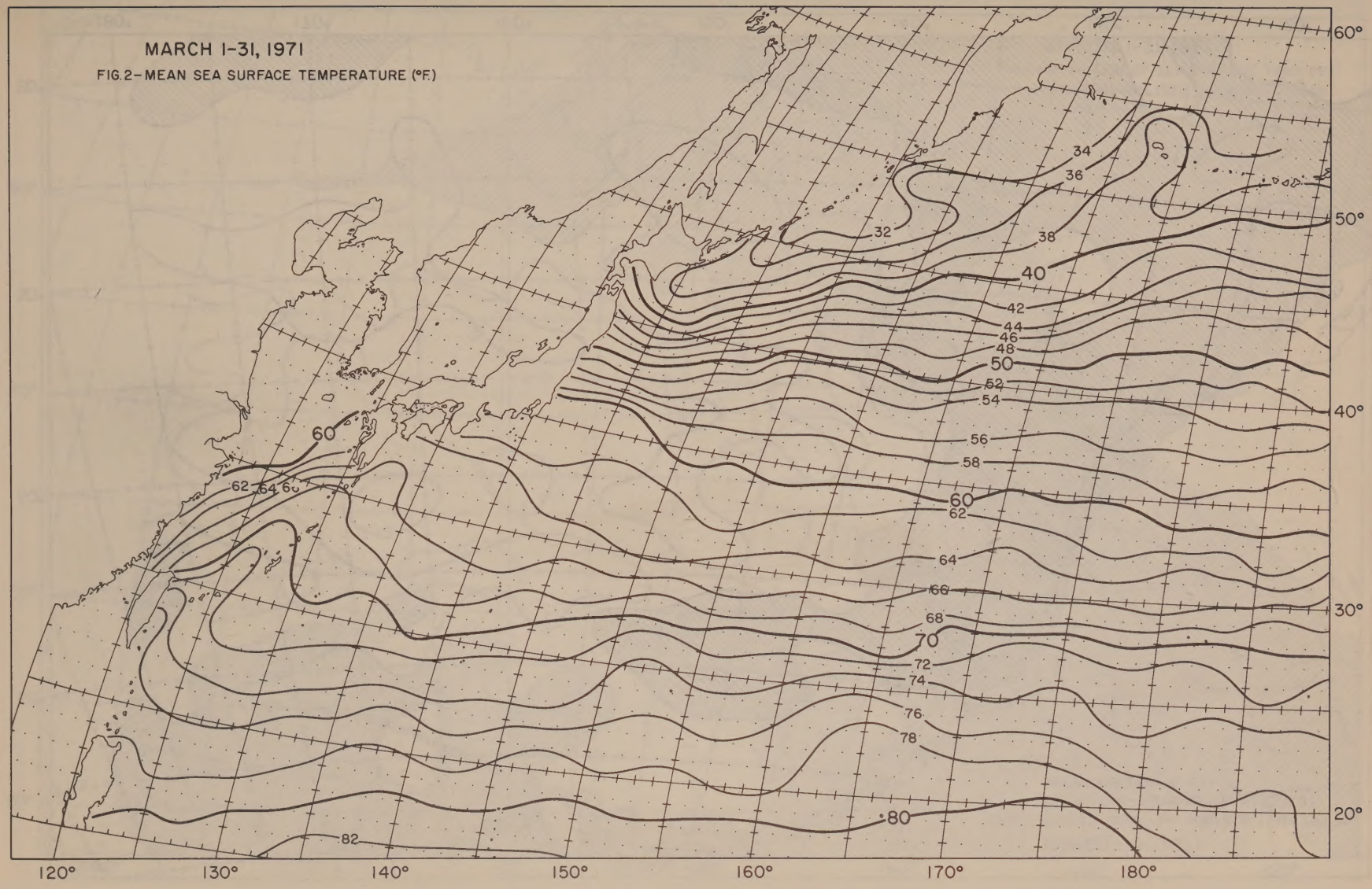
Figure 9. -- Observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true(, resultant wind speed (knots), and average wind speed (Knots) regardless of direction.

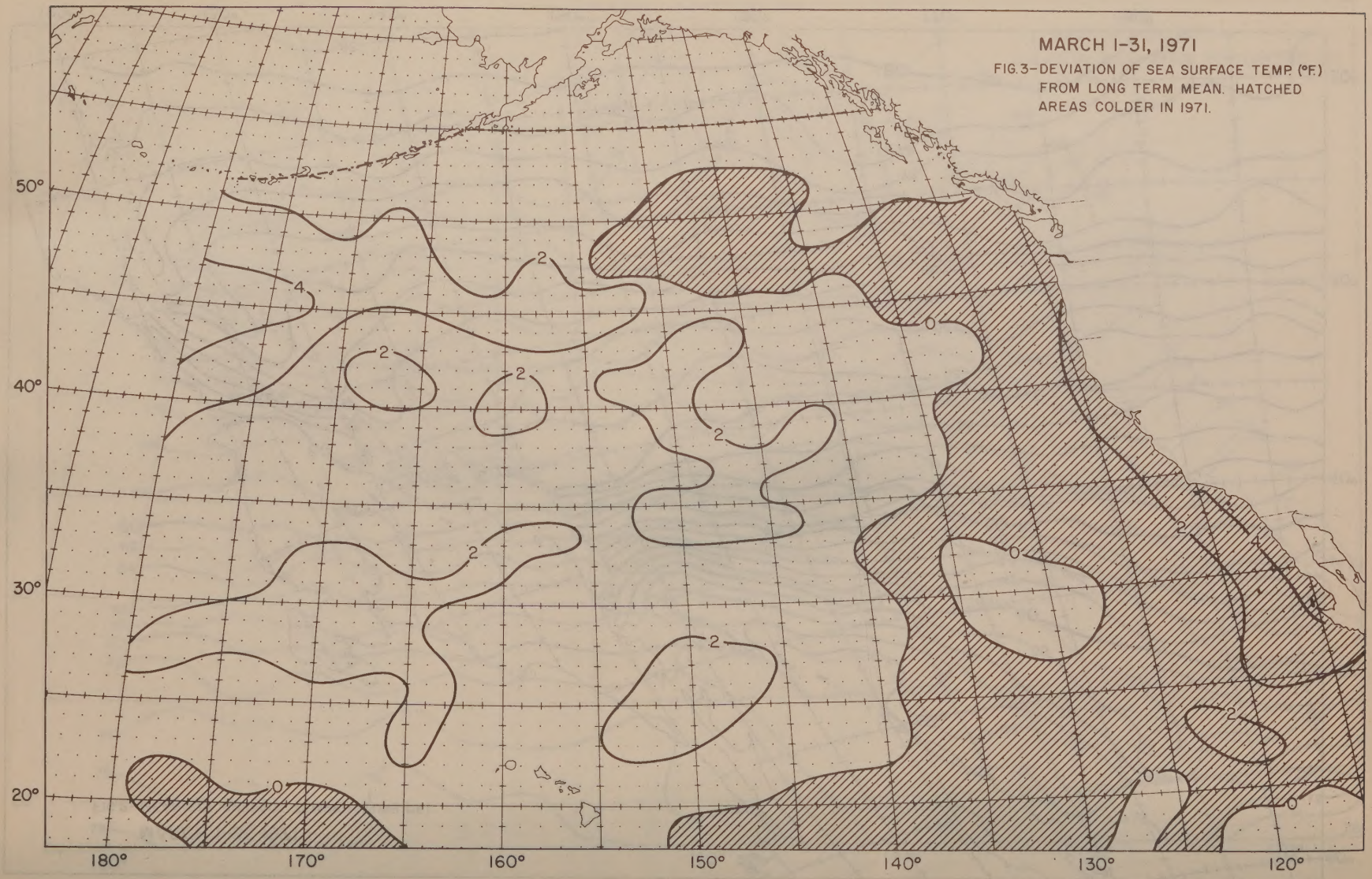
James A. Renner, Fishery Biologist
Kenneth S. Raymond, Scientific Illustrator
April 7, 1971

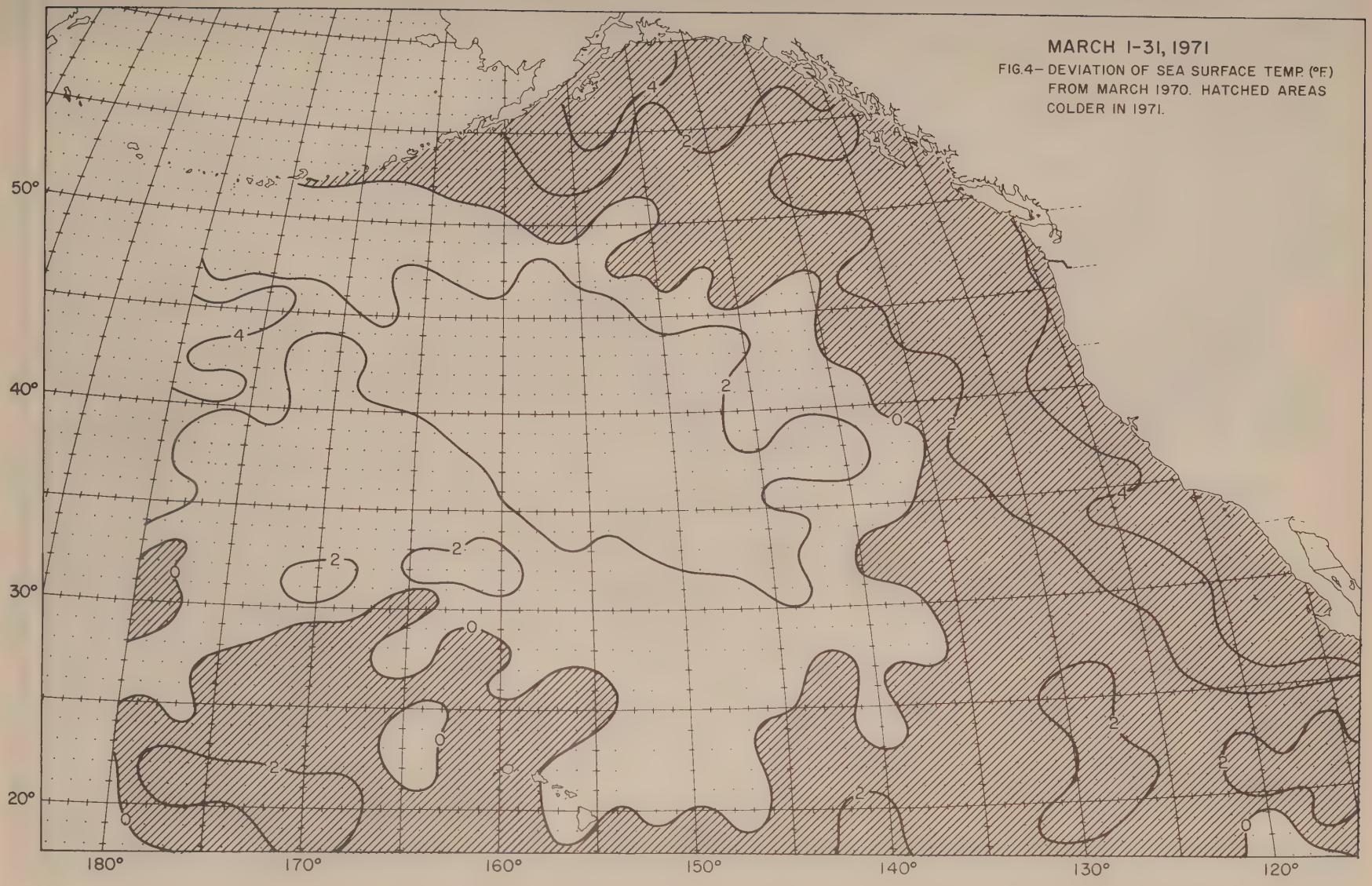

MARCH 1-31, 1971
FIG.1-MEAN SEA SURFACE TEMPERATURE (°F.)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°

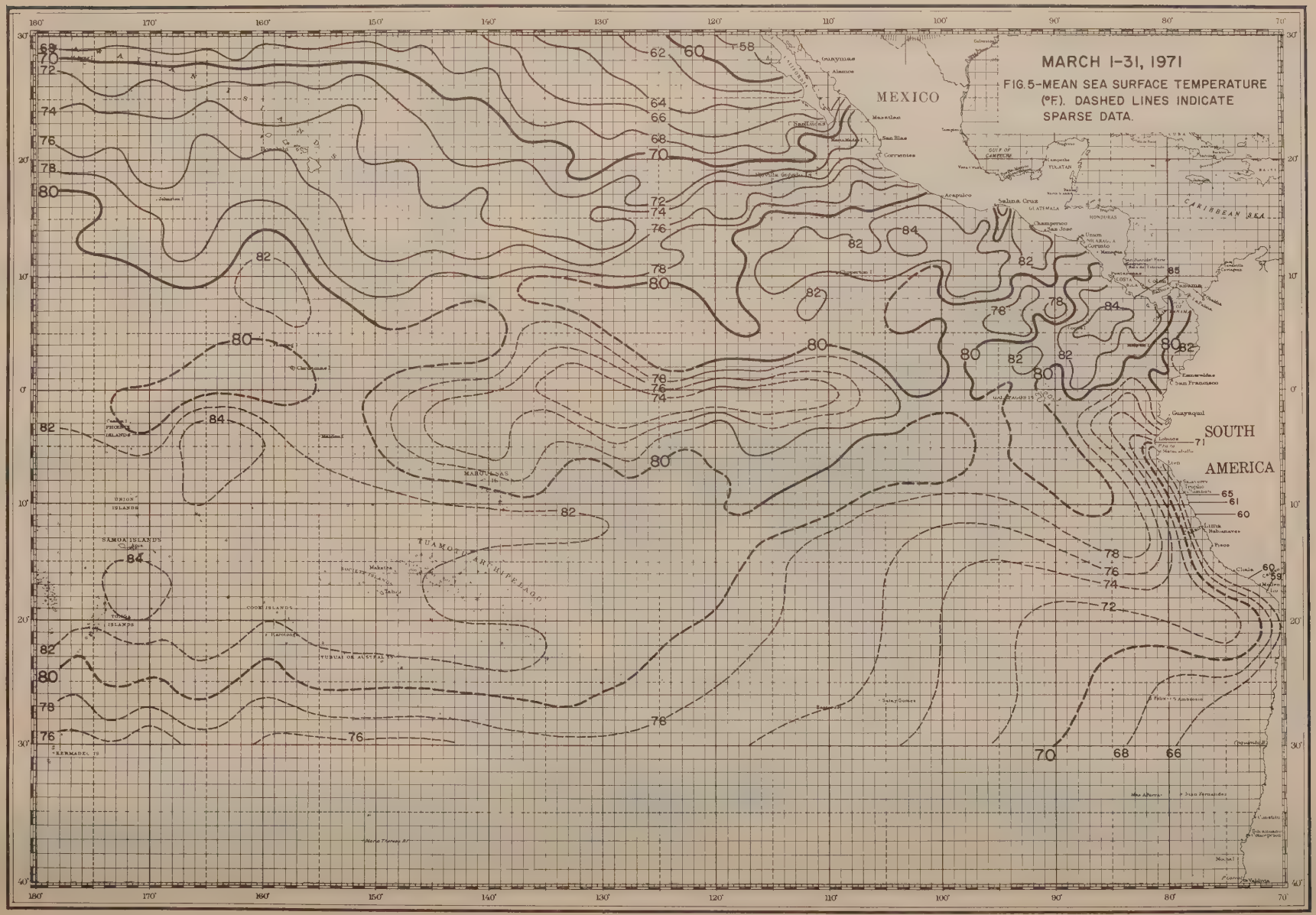
MARCH 1-31, 1971

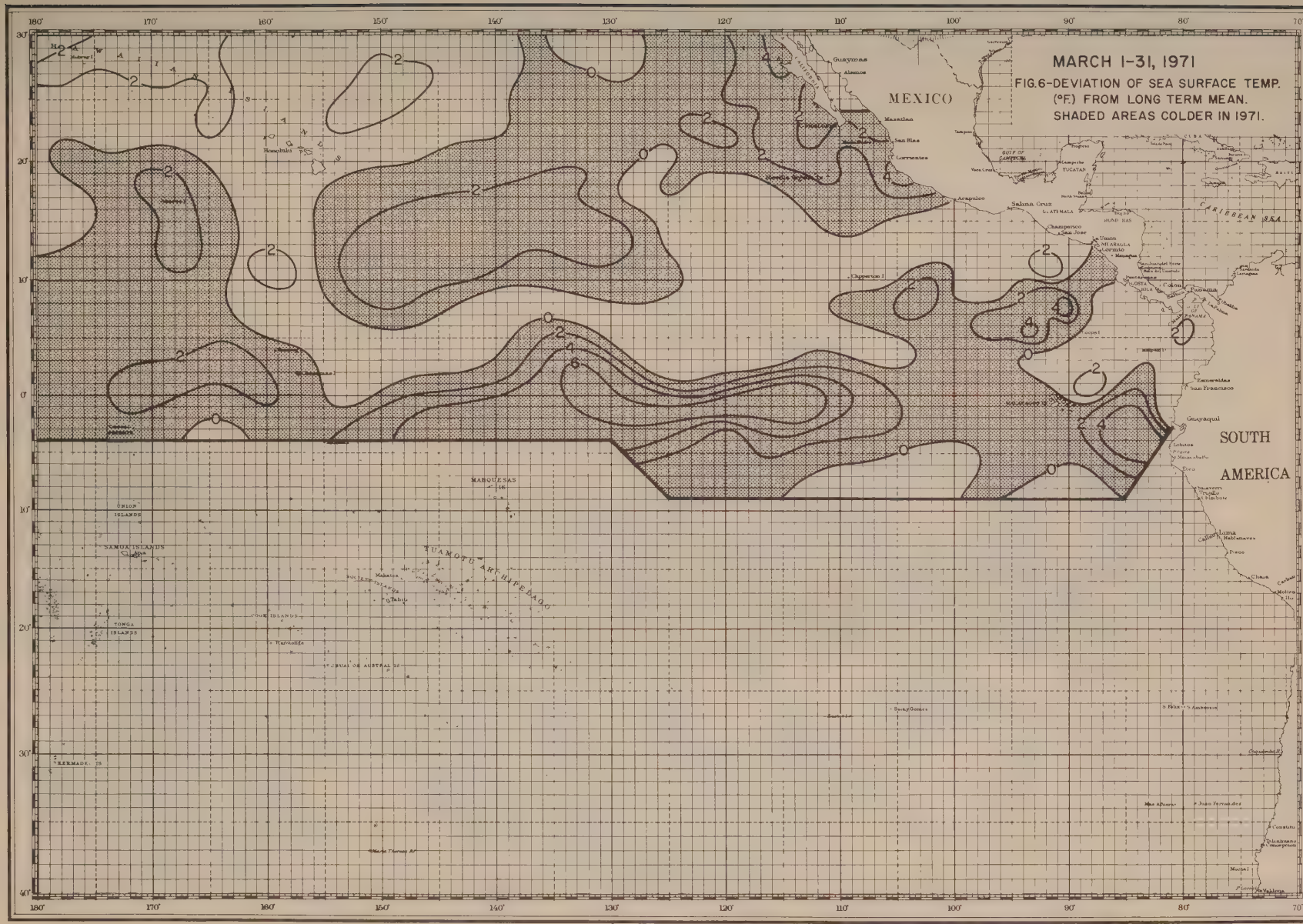
FIG. 2 – MEAN SEA SURFACE TEMPERATURE (°F.)

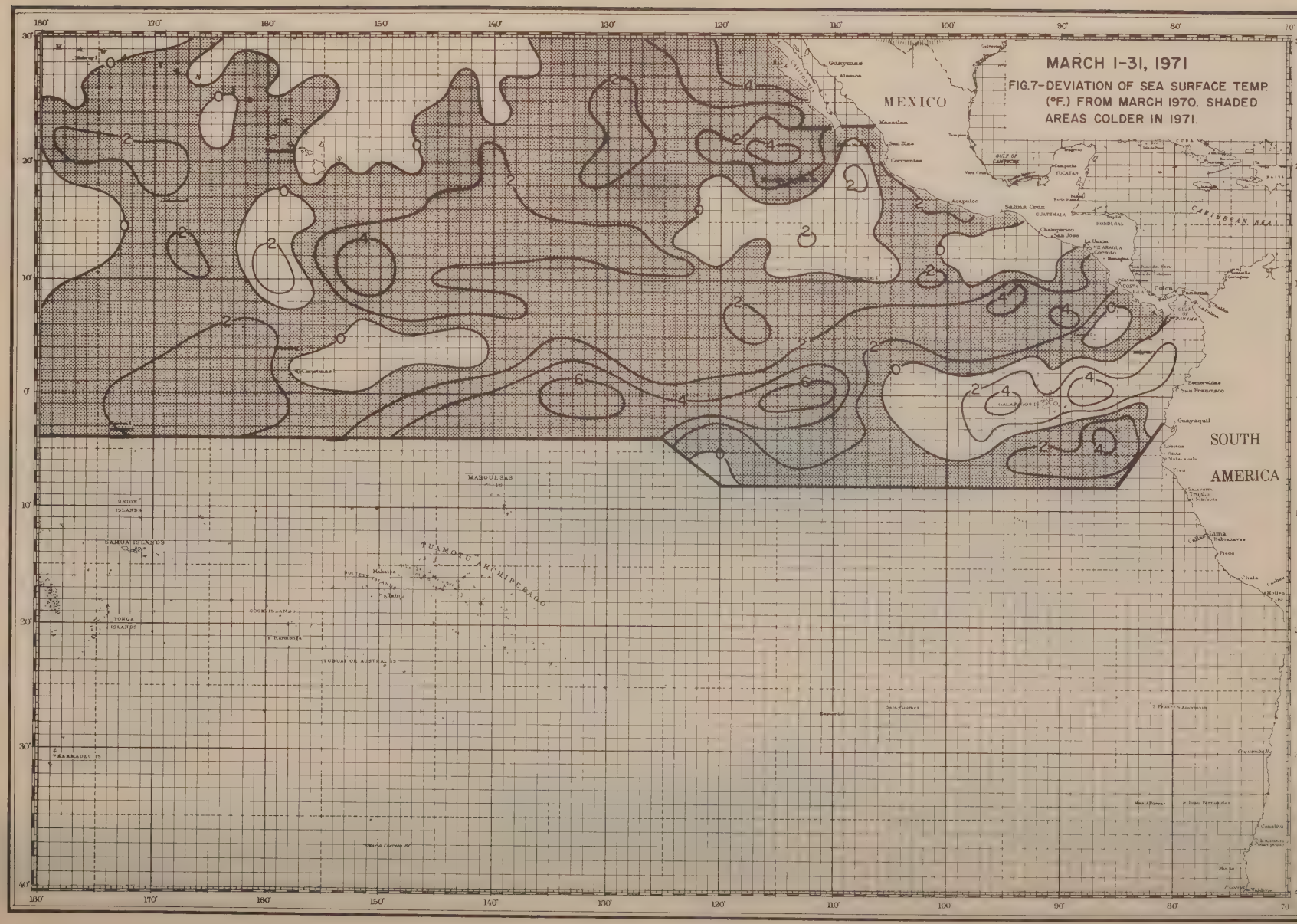


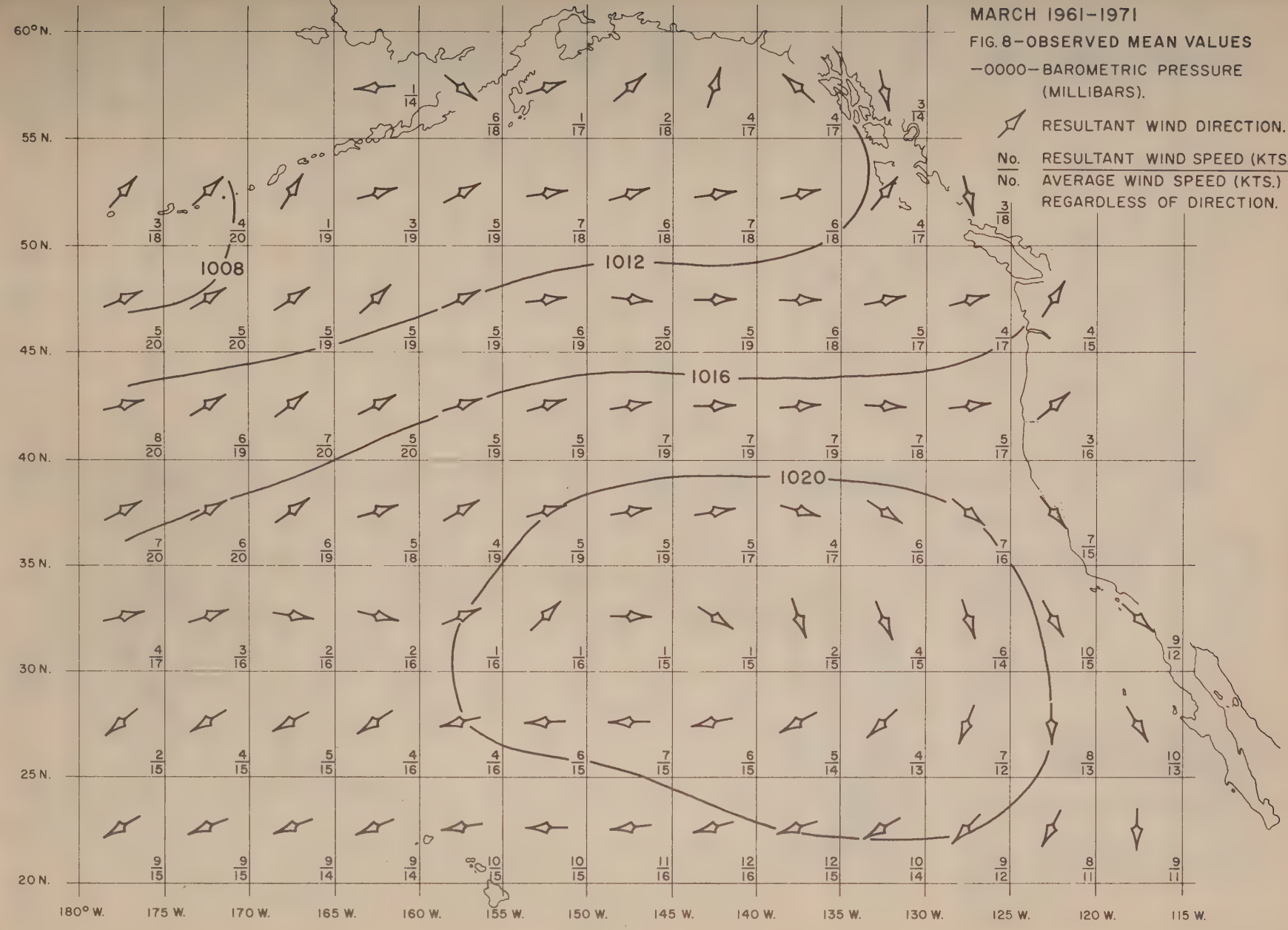

MARCH 1-31, 1971
FIG. 3-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM LONG TERM MEAN. HATCHED AREAS COLDER IN 1971.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
4
2
2
2
2
2
0
0
2
0
2
0
0
0

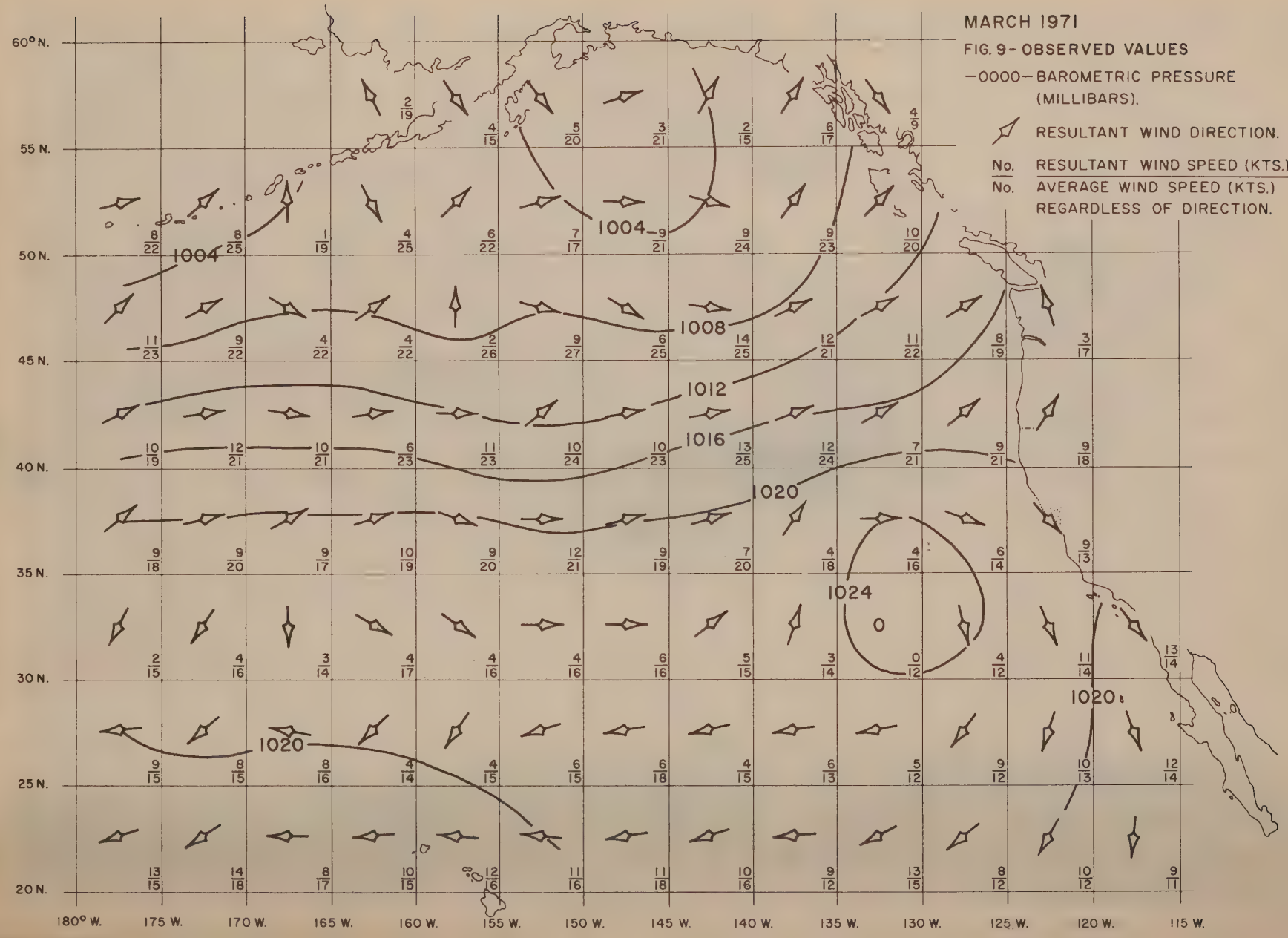

MARCH 1-31, 1971
FIG.4– DEVIATION OF SEA SURFACE TEMP. (°F.) FROM MARCH 1970. HATCHED AREAS COLDER IN 1971.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
4
2
0
2
4
2
2
0
0
0
2
2
0
2
2
0

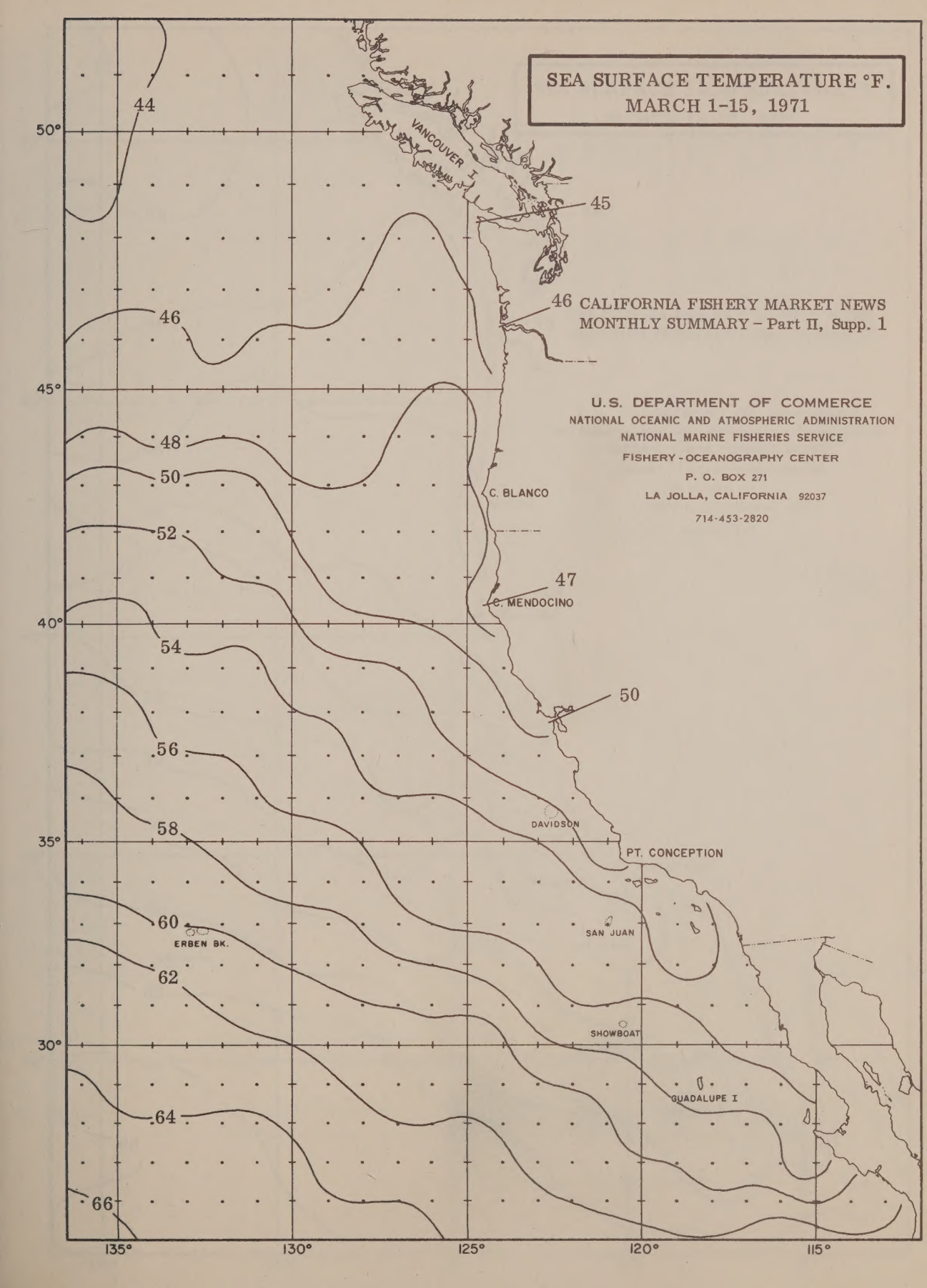

MARCH 1-31, 1971
FIG.5-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
HONDURAS
GUATEMALA
COSTA RICA
PANAMA
NICARAGUA
SAMOA ISLANDS
TUAMOTU ARCHIPELAGO
COOK ISLANDS
TONGA ISLANDS
MARQUESAS
Guayaquil
Lima
Callao
Salina Cruz
Acapulco
Manzanillo
Mazatlan
San Blas
Corrientes
Puerto Vallarta
Champerico
Corinto
Balboa
Tahiti
Pitcairn I.
Easter I.
Juan Fernandez
Mocha I.
Valparaiso
Concepcion
Talcahuano
Arica
Iquique
Antofagasta
Coquimbo
Callao
Paita
Salaverry
Chimbote
Pisco
Ilo
Mollendo
Tumbes
Manta
Esmeraldas
San Francisco
Galapagos Is.
Clipperton I.
Cocos I.
Malpelo I.
Johnston I.
Palmyra I.
Christmas I.
Fanning I.
Penrhyn I.
Nassau I.
Suwarrow I.
Manihiki
Rakahanga
Pukapuka
Rarotonga
Aitutaki
Mangaia
Tubuai Is.
Raivavae
Rapa
Marotiri
Henderson I.
Ducie I.
Oeno I.
Pitcairn I.
Gambier Is.
Marquesas Is.
Nuku Hiva
Hiva Oa
Fatu Hiva
Ua Pou
Ua Huka
Nuku Hiva
Tuamotu Is.
Makatea
Rangiroa
Tahiti
Moorea
Raiatea
Huahine
Bora Bora
Tubuai


MARCH 1-31, 1971
FIG.6-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM LONG TERM MEAN.
SHADED AREAS COLDER IN 1971.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
HAWAIIAN ISLANDS
MARQUESAS
TUAMOTU ARCHIPELAGO
SAMOA ISLANDS
TONGA ISLANDS
COOK ISLANDS
BERMUDA IS.
Acapulco
Salina Cruz
Champerico
Guayaquil
Lima
Callao
Chimbote
Trujillo
Talara
Tumaco
Buenaventura
San Francisco
Tahiti
Rarotonga
Pitcairn I.
Juan Fernandez
Easter I.
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°


MARCH 1-31, 1971
FIG.7-DEVIATION OF SEA SURFACE TEMP. (°F.) FROM MARCH 1970. SHADED AREAS COLDER IN 1971.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
MARQUESAS
TUAMOTU ARCHIPELAGO
TONGA ISLANDS
COOK ISLANDS
SAMOA ISLANDS
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
40°


MARCH 1961-1971
FIG. 8-OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


MARCH 1971
FIG. 9- OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
1024
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.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DAVIDSON
SAN JUAN
SHOWBOAT
GUADALUPE I
ERBEN BK.
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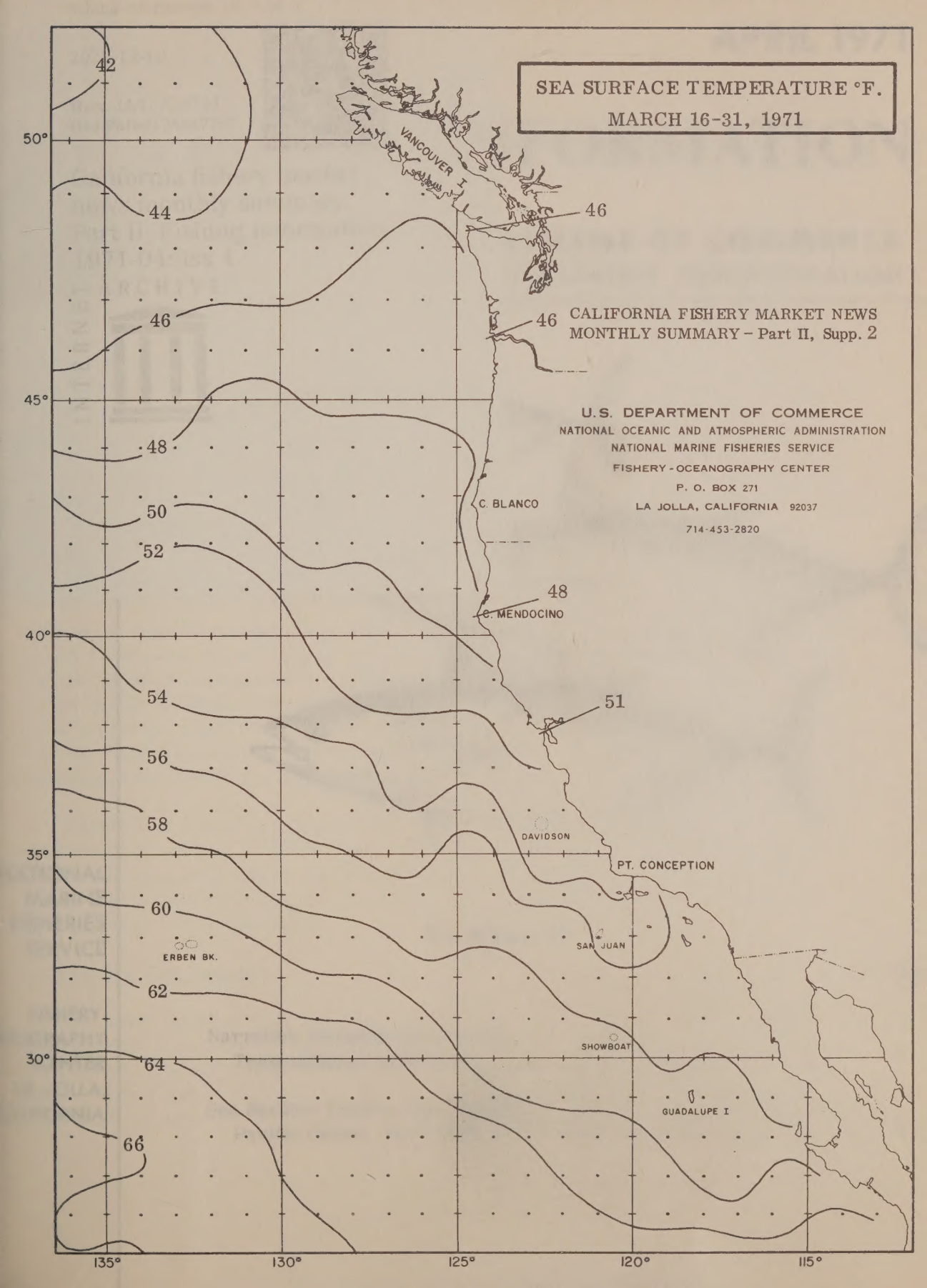
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MARCH 16-31, 1971
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MONTHLY SUMMARY – Part II, Supp. 2
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50°
45°
40°
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30°
135°
130°
125°
120°
115°

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